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SUBJECT: ABU DHABI MASDAR CITY MAINTAINS CARBON NEUTRAL TARGET
AMIDST IMPLEMENTATION CHALLENGES

REF: Abu Dhabi 945

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11. (SBU) Summary: Masdar City - a six square kilometer grand experiment backed with \$24 billion funding to create the world's first carbon-neutral, zero-waste, renewable energy powered city supporting 25,000 residents and 50,000 commuters - continues to work through many critical issues in its implementation. Lofty ambitions remain -- and challenges abound -- but there are manifold opportunities for U.S. engagement and partnerships. While current renewable energy solutions cannot meet Masdar City's projected energy needs, the team believes future technology improvements will let them achieve their objectives and remains confident about completing Masdar City (MC) by 2015 (reftel). The first significant milestone for MC is August 2009 when the Masdar Institute for Science and Technology (MIST) will open its doors in partnership with MIT for 80 students. A 10MW solar array has been selected to power this first phase. Masdar is receptive to US private sector and government collaborations. An October Department of Energy/national laboratory delegation visit yielded several collaboration areas. Masdar also agreed to participate in an EPA led 2009 MEPI initiative to develop a pollution prevention/cleaner production network in the MENA region. End summary.

Lofty Ambitions on Track

12. (U) Amman ESTH Hub officer and Econoff held November 16 meetings with Masdar Sustainability Manager Christopher Drew and CH2MHill Sustainability Manager Richard Perry to discuss MC progress and opportunities for U.S. collaboration. MC's ambitious plans include creating the world's first carbon-neutral, zero-waste, renewable energy powered city supporting 25,000 residents and 50,000 commuters in a six-square kilometer area. Target completion is 2015, though the first major milestone for the opening of the Masdar Institute of Science and Technology (MIST) in collaboration with the Massachusetts Institute of Technology (MIT) is scheduled for August 12009. MIST will grow from an initial 80 students to 400 students in graduate and doctoral programs and is expected to support renewable energy research and validate MC technology deployments.

13. (U) The current energy mix projection for powering MC is: 70 percent solar photovoltaic cells (PV); 25 percent concentrated solar power (CSP); 4 percent waste conversion; and, 1 percent wind and

other energy sources such as geothermal. While a PV test site with 40 1-kW arrays from 32 vendors is in operation, Masdar has already chosen SunPower for a 10MW roof-top array to power MIST by August 2009. Masdar also has several additional pilot studies in progress: a geo-thermal cooling study using ground sourced heat pumps; a CSP absorption study; a hydrogeology study; and a bio-mass study.

14. (SBU) The US firm CH2MHill is the overall project manager and lead vendor for MC development. Roughly 185 CH2MHill staff are supplementing 500-600 Masdar staff. Despite the current global financial crisis, Drew and Perry noted they expect continued access to required funding.

15. (U) The buildings in MC will not be LEED or BREEM certified - which are commonly adopted international certifications for Green buildings. Drew believes that the Masdar brand will rise far above LEED Platinum certification standards given how high they have set the bar for MC. For instance, the buildings in MC can only be powered by renewable energy produced within MC.

16. (U) MC also targets reducing the carbon footprint of materials used in the full supply chain - from the source through to completion of construction. Masdar plans to account for carbon emissions associated with the manufacturing of a product as well as the transportation of the product to MC. Since shipping products from the US implies a higher carbon footprint, Drew said US manufactured products are at a potential disadvantage. Masdar is also looking at the sources of energy used to make the materials. For instance, goods produced using geothermal energy in Iceland will fare better than goods produced using fossil fuel power. Drew also wants to use sustainable materials and is seeking US expertise in this arena.

Challenges Abound - Money Does Not Buy Time

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17. (SBU) Despite Masdar's lofty ambitions, challenges abound with hundred of details yet to be sorted out. MC staff noted that Abu Dhabi government officials expect faster results. However, there are many unknowns in a groundbreaking project such as MC and new challenges are being encountered every day. Schedule management is the biggest challenge. Drew noted, despite the expectation that if you throw enough money at a problem it can be solved, "If the technology is not there yet, it cannot be solved. Money does not buy time."

18. (U) MC also finds itself in a technology conundrum - currently available technology does not allow the city to be fully sustained by its renewable energy generation. However, with incremental technology improvements they have an expectation of achieving their target. Energy generation from waste is also problematic: MC is expected to generate 80-90 tons of waste per day - typically not enough for a private sector company to set up a waste management-energy conversion facility which needs a minimum of 250 tons/day. Wind energy deployment in MC is also limited by 60 meter height restrictions imposed by the nearby Abu Dhabi airport.

19. (SBU) Water is another challenge for MC and perhaps the area where MC's grand ambitions might be showing some cracks. The initial objective was to extract groundwater and desalinate. The current options being considered include: getting off-site water piped to Masdar; undertaking sea-water desalination; or, using bottled potable water.

Significant Opportunities for US engagement

110. (U) A Department of Energy delegation including the national laboratories visited Masdar in early October and reviewed potential collaboration areas. The delegation discussed several potential collaboration areas with Masdar including smart-grid management, sustaining the operational efficiency of MC, hosting MC staff at the US national laboratories, and providing analysis and feedback to MC regarding their solar array performance.

¶11. (U) In addition, Drew and CH2MHill noted that they continue to seek linkages to US private sector representatives who can provide innovative renewable energy solutions. Masdar is able to explore potential technology solutions through demonstration projects, joint ventures, or through an RFP process. Masdar specifically requested assistance for linkages to sustainable material vendors. To respond to this interest, DOE led a US trade delegation visit to Masdar in late October.

¶12. (U) ESTH Hub officer also shared information about EPA plans to develop a pollution prevention/cleaner production network in the MENA region through a MEPI program. Modeled after the US National Pollution Prevention Roundtable (NPPR) which is a consortium of government, private sector and civil society members, the planned MENA network would bring industry and government sector representatives together. The EPA and the NPPR plan to support 2 meetings in 2009 to lay the foundation for developing this MENA network. Masdar staff expressed their desire to join such an effort and benefit from regional experiences.

¶13. (SBU) Comment: Despite the global financial crisis and related liquidity problems, Masdar officials remain confident of high-level political and financial commitment to the project's success. Indeed, senior Abu Dhabi officials stress that Masdar is a key investment in the emirate's long-term economic diversification efforts. Masdar's deep coffers should attract U.S. private sector renewable energy companies. However, besides being a technology solutions user, Masdar also hopes to become a technology solutions provider and investor through its Clean Technology Fund. Masdar's ambitions are greater than just showcasing Masdar City; Masdar's parent Mubadala has also invested in General Electric, a 120 million euro investment in a Finnish wind-turbine manufacturer, and set up a PV manufacturing plant in Germany. Recognizing the opportunities, other countries including the United Kingdom, Germany, Spain, and Japan are also actively engaged in varied collaborations with MC. End Comment.

¶14. (U) The next Masdar-sponsored World Future Energy Forum (<http://www.worldfutureenergysummit.com>) will be held January 21-23, 2009 in Abu Dhabi and is expected to draw high-profile international

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participation. The January 2008 event included participation by Secretary of Energy Samuel Bodman.
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